

## Preface

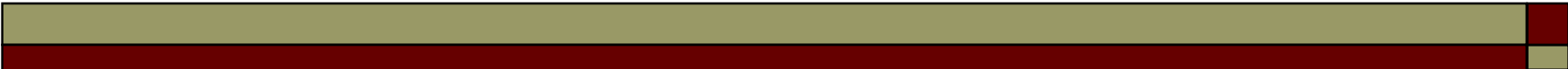
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- ❑ Many of the graphics in this presentation are animated GIFs or animated graphics. They will not animate unless you view in Screen Show. Slide transitions are not recommended.
- ❑ Many of the briefing slides have briefer notes. The notes provide much more information than is needed for the audience.
- ❑ It is recommended that you edit the briefer notes to suit your requirements and level of expertise in the subject matter.
- ❑ **Tailor this briefing to meet YOUR needs**, hide the slides that are not used. There is no “one size fits all” briefing. Use only the slides for the specific country you need.
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## Improvements

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**Commander, USACHPPM, ATTN: MCHB-CS-OHI, 5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010--5403**, or by using the E-mail address on the USACHPPM website at: *<http://chppm-www.apgea.army.mil/mtb/>*
- If you develop new slides or revise existing slides, please forward to USACHPPM for future updates of this briefing.
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# Tsunami Relief Effort

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## **PREVENTIVE MEDICINE BRIEFING**

**Presenter's Name**

**Presenter's Command**

**Local Contact Information**

**Prepared by:**

**U.S. Army Center for Health Promotion and Preventive  
Medicine**

**(800) 222-9698/ DSN 584-4375/(410) 436-4375**

**<http://usachppm.apgea.army.mil>**

# Purpose

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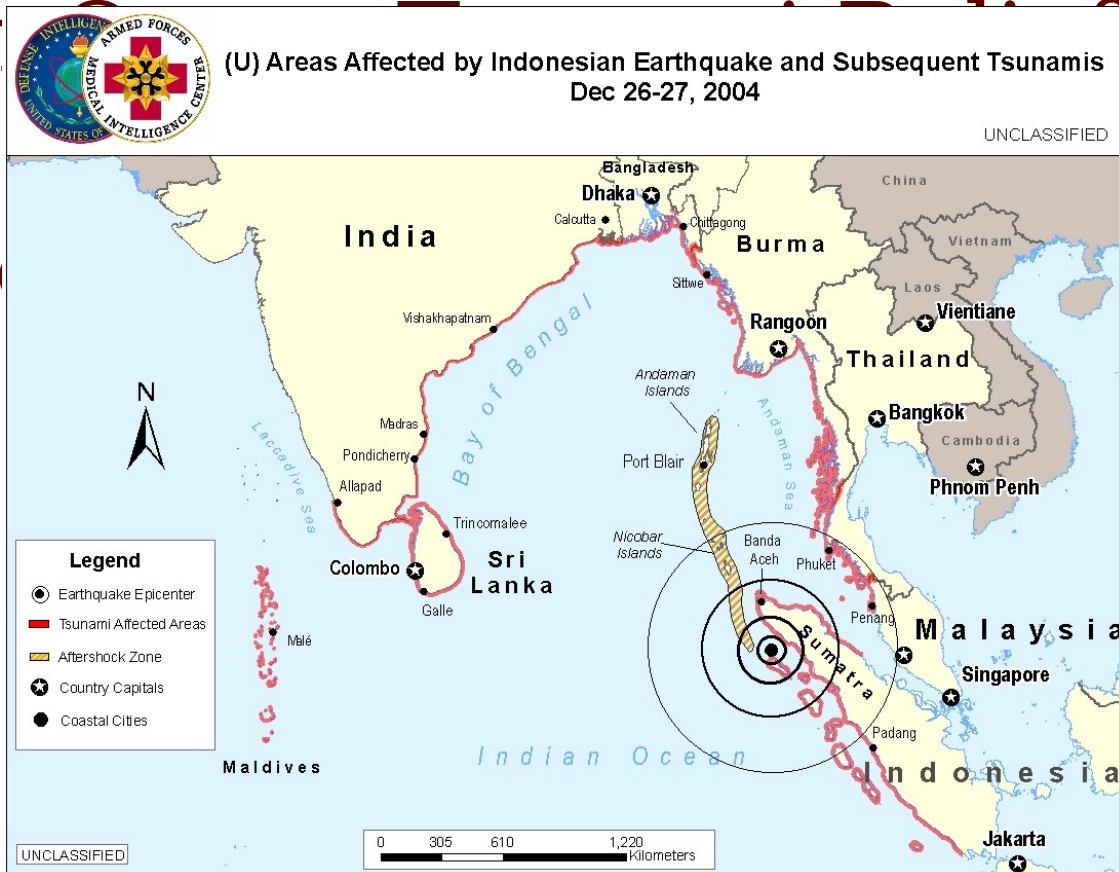
To inform personnel deploying in support of the Indian Ocean Tsunami Relief Effort of:

- potential health hazards
- individual countermeasures



**In wars, battles, and military training, the greatest loss of forces is not caused by combat wounds. Most losses are the result of disease and non-battle injury.**

# Indian Effort Medi



A devastating megathrust earthquake occurred off the west coast of Northern Sumatra on Sunday, December 26, 2004 at 7:58:53 local time at epicenter



# Countries Affected

- ❑ Bangladesh
- ❑ Burma
- ❑ India
- ❑ Indonesia
- ❑ Kenya
- ❑ Malaysia
- ❑ Maldives
- ❑ Seychelles
- ❑ Somalia
- ❑ Sri Lanka
- ❑ Tanzania
- ❑ Thailand

December 26, 2004 at 10:20 am local time at epicenter, approximately 1 hour after the first set of waves hit. Kalutara, Sri Lanka



# Tsunami Victims\*

	Dead	Missing	Homeless
East Africa ( Kenya, Seychelles, Somalia, Tanzania)	312	n/a	54,000
Bangladesh	2	n/a	n/a
Burma (Myanmar)	90	10	5,272
India	9,682	6,107	n/a
Indonesia	101,318	10,070	Hundreds of thousands
Malaysia	68	6	8,000
Maldives	82	26	13,311
Sri Lanka	30,615	4,984	835,028
Thailand	5,291	3,716	n/a
Total	147,460	24,919	



\*From USA Today, *The Tsunami's Aftermath*, 7 January 2005; and USA Today.com, *Aid Totals, Photo*; a sidebar to *Tsunami Death Toll Exceeds 150,000* posted 7 Janua

# Hardest Hit Areas

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- ❑ Indonesia
- ❑ India
- ❑ Sri Lanka
- ❑ Thailand





# Medical Capabilities

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- ❑ **Indonesia** - no emergency management system. In urban areas, a limited emergency response capability, supported by 24-hour emergency rooms, ambulances, and helipads at major hospitals.
- ❑ **Sri Lanka** - has a disaster response plan but limited capability to execute it. Ground evacuation capability is limited. Ambulance service is available in Colombo, but it is not reliable.
- ❑ **Thailand** - good medical infrastructure, but its disaster response capabilities do not meet US standards.

# Medical Capabilities (cont)

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- **India** - medical infrastructure inadequate for a widespread disaster. Medical personnel are poorly trained, shortages of medical materiel occur, and casualty evacuation assets are woefully insufficient for the current mass-casualty situation.
- **Malaysia** - Substandard emergency medical personnel and services. Most emergency medical personnel are not trained, and many ambulances are only equipped with oxygen.
- **Maldives** - The number of islands and atolls prevents prompt emergency transport - usually via air to the Male Airport. The qualifications and training of physicians varies widely because approximately 75 percent are expatriates. Native health care workers are not qualified or trained to US standards.

# Vaccine Coverage Estimates

## (%)

	<u>Hep-B</u> <u>Tetanus</u>	<u>DPT3</u>	<u>Measles</u>		<u>Polio3</u>	
<b>Indonesia</b>	<b>75</b>	<b>90</b>	<b>90</b>	<b>90</b>	<b>84</b>	
<b>Sri Lanka</b>	<b>UNK</b>	<b>99</b>	<b>99</b>	<b>98</b>	<b>UNK</b>	
<b>Thailand</b>		<b>95</b>	<b>96</b>	<b>94</b>	<b>97</b>	<b>UNK</b>

**Source: WHO-UNICEF**





# Infectious Disease Risk

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- Increases in transmission of:
  - Food- and waterborne diseases due to the lack of potable water
  - Respiratory diseases due to crowding in camps
  - Vector-borne diseases such as dengue, malaria, Japanese encephalitis, and chikungunya likely will start increasing over the next 2 to 3 weeks
  - Diseases from contact with soil

# Bodies of Victims Pose Minimal

## Disease Risk

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- Unburied human remains not a disease threat
- Cadavers in the water supply rarely transmit diseases.
- Increased number of filth flies can increase shigellosis.
- Mortuary staff, and body retrieval teams risk exposure to hepatitis B virus (HBV) and HIV
- For personnel exposed to blood and body fluids:
  - Use gloves when handling bodies or body fluids
  - Use eye protection, gowns, and masks when large quantities or splashes of blood are anticipated
  - Wash hands frequently
  - Use body bags to reduce the risk of contamination

# Infectious Disease Priorities

## (U) Diseases of Importance for Victims of Asia Tsunami, December 2004

### Enteric

#### Incubation Period (days)

#### Major Importance

Campylobacter	2-5
Cholera	2-3
Enterotoxigenic E. Coli (ETEC)	1-3
Hepatitis A virus	15-50
Paratyphoid	1-10
Salmonella	0.5-1.5
Shigella	1-3
Typhoid	8-14

#### Minor Importance

Amoebic dysentery	14-30
Hepatitis E virus	15-64

### Vector-borne

#### Incubation Period (days)

Dengue	3-14
Malaria (P. falciparum)	7-14

### Respiratory

#### Incubation Period (days)

Measles	7-14
Secondary bacterial pneumonia infections (e.g. streptococcus, pneumococcus, mycoplasma, chlamydia)	1-30
Viral upper respiratory diseases (e.g. influenza, adenovirus, parainfluenza viruses, rhinovirus, coronavirus)	1-10

### Other Diseases of Potential Importance

#### Incubation Period (days)

Rabies	21-56
Tetanus	3-21





# Issues for Deploying Personnel

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# Summary of Health Risks

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- Infectious Diseases
  - Food and water-borne
  - Insect-borne
  - Sexually transmitted
  - Contact with fresh water, soil
  - Animal contact
  - Respiratory
- Injuries
- Psychological Stress
- Heat and Sun
- Environmental Pollutants

# Overview of Preventive Measures

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- ❑ Receive vaccinations and take malaria pills as directed
- ❑ Use DEET, permethrin, and bed nets to prevent insect bites
- ❑ Consume only approved food and beverages
- ❑ Maintain good personal hygiene
- ❑ Maintain hydration and use sunscreen
- ❑ Avoid domestic and wild animals, fresh water, and soil
- ❑ Avoid sexual activity - protect yourself from blood, body fluids
- ❑ Sleep head-to-toe if billeted in common areas
- ❑ Seek medical care immediately if you become ill
- ❑ Follow stress-prevention techniques
- ❑ Follow personal security and safety guidelines





# Diseases From Ingestion of Contaminated Food and Water

# Food and Water-borne Diseases

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- Diarrhea
- Cholera
- Hepatitis A and E
- Typhoid Fever
- Chemicals/Pesticides
- Heavy Metal Poisoning

## COUNTERMEASURES

- Do not consume any food, ice, water, or beverage (to include bottled water) that have not been approved by the U.S. military
- Assume all non-approved food, ice, and water is contaminated

Even a one-time consumption of these foods or water may cause severe illness

# Diarrhea

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- Cause: drinking water or eating food that contains bacteria, virus, or protozoa
- Symptoms: frequent, runny stools
- Can be a symptom of campylobacter, *e. coli*, shigella, salmonella, hepatitis A, cholera, hepatitis E, giardia, or malaria

**If you consume local food or water,  
you will almost always get diarrhea.**

# Hepatitis A

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- Cause - Putting something in the mouth that has been contaminated with the stool of a person with hepatitis A
- Symptoms - jaundice, fatigue, abdominal pain, loss of appetite, nausea, diarrhea, fever
- Countermeasures
  - Hepatitis A Vaccine
  - Short-term protection from immune globulin
  - Wash your hands with soap and water after using the bathroom, and before preparing and eating food.

# Insect-Borne Diseases

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# Malaria

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- Caused by parasite obtained from mosquito bite
- Symptoms
  - Severe symptoms and death possible
  - Fever and flu-like illness, chills, headache, muscle aches, and tiredness
- Countermeasures
  - Take anti-malarial medications and prevent mosquito bites
  - Use the DOD Insect Repellent System
  - Sleep under a permethrin treated bed net

Malaria that is resistant to anti-malarial drugs can occur, it is critical that you prevent mosquitoes from biting you.

# Dengue Fever

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- Caused by virus obtained from day-biting mosquitoes
  - Increased risk of infection in urban areas
  - Increased risk May-October
- Symptoms
  - Sudden onset, high fever, severe headaches, joint and muscle pain, nausea/vomiting, and rash.
  - Illness may last up to 10 days, complete recovery may take 2-4 weeks
- Countermeasures
  - Prevent mosquito bites
  - Use the DOD Insect Repellent System

# Japanese Encephalitis

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- Caused by virus obtained from mosquito bites
  - Increased risk in rural areas
- Symptoms
  - Fever, headache, disorientation, and stupor
  - More severe symptoms possible
  - Fatality rate 5-10% or higher
- Countermeasures
  - Vaccination
  - Prevent mosquito bites
  - Use the DOD Insect Repellent System
  - Sleep under a permethrin treated bed net



# Chikungunya Virus

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- Caused by virus obtained from mosquito bites
  - Increased risk May-October (rainy season)
  - Increased risk in urban and village areas
- Symptoms
  - Sudden onset of fever, rash on trunk and limbs, back pain, and severe joint pain / arthritis in multiple joints
- Countermeasures
  - Prevent mosquito bites
  - Use the DOD Insect Repellent System
  - Sleep under a permethrin-treated bed net

# DOD Insect Repellent System



**Permethrin  
On  
Uniform**



**DEET On  
Exposed  
Skin**



**Properly  
Worn  
Uniform**

**MAXIMUM  
~~PRO~~TECTION**



## **YOU NEED TO KNOW...**

Dry cleaning removes permethrin from the uniform



# Countermeasures (continued)

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- ❑ Wash and inspect your body for insects/ticks and bites daily
- ❑ Use buddy system to check clothing routinely
- ❑ Launder uniform routinely to remove insects and eggs
- ❑ Order a permethrin-impregnated bed net for use while sleeping

NSN 3740-01-516-4415

- Otherwise, treat a bed net before use by spraying the outside of the net with permethrin
- Tuck edges under cot or sleeping bag
- Don't let net touch your skin while



# Diseases Transmitted By Body Fluids And Sexual

Activity  
Examples: HIV, Hepatitis-B,  
herpes, gonorrhea, syphilis,  
chlamydia

# Hepatitis B

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- ❑ Cause - Hepatitis B virus that attacks the liver
- ❑ Transmitted by direct contact with the blood or body fluids of an infected person
- ❑ Symptoms - jaundice, fatigue, abdominal pain, loss of appetite, nausea, vomiting, joint pain
- ❑ Countermeasures
  - Hepatitis B vaccine
  - Use latex condoms correctly every time you have sex
  - Don't share personal items that might have blood on them
  - Follow routine barrier precautions and safely handle needles and other sharps



# Diseases Transmitted by Contact with Animals


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# Rabies

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- Major public health problem in the entire region
- Caused by virus obtained from contact with saliva of infected animal
  - Infected animal can be any warm-blooded animal
- Symptoms
  - Rabies is 100% fatal once symptoms develop
  - Fever, headache, tingling and discomfort at bite site
  - Late symptoms include anxiety, confusion, agitation, delirium, abnormal behavior, hallucinations, and insomnia
- Countermeasures
  - Avoid contact with domestic and wild animals
  - If bitten or scratched, wash wound vigorously for 5 full minutes with soap and water, then seek medical care immediately for vaccine and other treatment





# Diseases Transmitted by Contact with Soil and Water

# Leptospirosis

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- Transmission likely occurs and goes unrecognized or underreported throughout Asia.
- Risk is 1-10 percent per month of personnel in close contact with contaminated bodies of fresh water could develop leptospirosis
- Caused by bacteria obtained from animal urine
  - Highest threat is skin contact with contaminated lakes, rivers, streams, or other water sources
  - Can acquire from food contaminated with rodent urine
- Symptoms
  - Severe symptoms and death possible
  - Fever, headache, muscle aches, vomiting, jaundice, anemia, and sometimes rash
- Countermeasures
  - Avoid swimming and wading in lakes, rivers, and streams
  - If high risk area, can pre-treat with doxycycline

# Tetanus

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- Cause: Wounds contaminated with bacteria
- Symptoms: lockjaw, stiffness in the neck and abdomen, and difficulty swallowing then fever, elevated blood pressure, and severe muscle spasms
- Countermeasure:
  - Vaccination



# Melioidosis

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- ❑ Bacterial disease endemic in many parts of Asia. Found in agriculture fields, mostly during the rainy season.
- ❑ Cause: direct contact with contaminated soil or water.
- ❑ Symptoms:
  - Variable depending on location of infection and whether it is acute or chronic
- ❑ Countermeasures
  - Wear boots and proper clothing during field work
  - In health care settings, use common blood and body fluid precautions to prevent transmission



# Acute Respiratory Diseases

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# Pneumonia

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- Most commonly caused by bacteria or viruses contracted from an infected person
  - Infected people release bacteria during, coughing, sneezing, speaking, or spitting
- Symptoms
  - Cough, possibly with blood or sputum, chest pain, weight loss, night sweats, fever, and weakness
  - Severe symptoms and death possible
- Countermeasures
  - Avoid unnecessary exposure to high-risk populations and buildings
  - Use N95 respiratory protection when directed




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# Avian Influenza

- Cause: Virus that usually does not make wild birds sick, but can make domesticated birds very sick and kill them
  - Also infects pigs, horses, seals, tigers, and whales
  - In rare cases it has infected humans.
- Symptoms: fever, cough, sore throat, muscle aches, eye infections, acute respiratory distress, viral pneumonia
- Countermeasure: Avoid sick birds and their droppings
- Projected impact on scheduled operations is minimal. Rare cases of H5N1 influenza could occur in forces exposed to infected poultry flocks. In the unlikely event that H5N1 influenza gains the ability to efficiently spread directly from person-to-person a significant number of forces worldwide could be affected.

# Psychological Stress

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• Remember the larger purpose of what you must do. You are showing care, giving hope, and preventing disease for the living. You are recovering the bodies for registrations and

# How to Face the Injured and Dead

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respectful burial.

- Limit exposure to the stimuli.
- Wear gloves and disposable uniforms if available.
- Mask odors with disinfectants, deodorants, air-fresheners.
- AVOID FOCUSING on any individual victims.
- Have people who did NOT search the body examine any materials collected for identification of the body or intelligence.
- Remind yourself the body is not “the person,” just the remains.

# How to Face the Injured and Dead

- Keep humor alive.
  - Don't desecrate or steal from the victims.
  - Say silent prayers.
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- Schedule frequent breaks; maintain hygiene, drink plenty of fluids, and eat good food.
  - Have your team get together for mutual support and encouragement.
  - Help buddies or subordinates in distress by being a good listener.
  - Prepare yourself for what you will see and do.
  - Don't feel guilty about distancing yourself mentally from the suffering of individuals.
  - Don't be disheartened by horrible dreams, feeling tense, or intrusive memories.
  - Participate in a critical event debriefing with trained people from your supporting unit ministry and/or behavioral health/combat stress control team.

# Environmental Issues

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# Heat and Sun Exposure

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- ❑ Wear proper clothing and head gear
- ❑ Use sunscreen
- ❑ Maintain adequate hydration
- ❑ Employ work-rest cycles
- ❑ Seek medical attention for symptoms of heat-related illness in yourself and your colleagues: dizziness, cramps, confusion, loss of consciousness

# Environmental Concerns

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## □ Chemical Hazards

- Contaminated soil and surface water
- Petroleum products: short term health risk for respiratory and nervous system depression
- Chlorine: short term exposure to high levels could cause burning of the eyes, nose, throat, coughing, nausea, headaches and dizziness
- Polychlorinated biphenyls (PCBs): short term low risk. Long term exposure could cause skin and mucous irritation, hyperpigmentation of the nails and skin, dizziness and nervousness
- Organophosphorus insecticides: short term exposure to high levels could cause abdominal pain, difficulty breathing, coma and death
- Organochlorine insecticides: short term exposure to high levels could cause seizures, respiratory depression, gastrointestinal upset and death



# Environmental Concerns (continued)

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- Physical Hazards
  - Compressed cylinder tanks (gasoline, propane, oxygen)
  - Flammable gases heavier than air may collect in low lying areas and present a fire or explosion hazard
  - Downed power lines

# Country Profiles

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# Indonesia

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- Approximately 3 times the size of Texas
- Consists of 13,667 Islands
- Five islands account for 90% of the land
  - Sumatra
  - Java
  - The Kalimantan portion of Boreno
  - Sulawesi
  - The Irian Jaya portion of New Guinea
- Terrain
  - Rugged volcanic mountains covered by dense tropical forests
- Climate
  - Extensive Cloudiness with lowland temperatures of 70-90 degrees with a relative humidity of 80-90 percent

# Indonesia

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Indonesia is HIGH RISK for these infectious diseases:

- Food and Waterborne Diseases: Diarrhea - bacterial, Hepatitis A, Typhoid / paratyphoid fever, Diarrhea - protozoal, Hepatitis E
- Vector-borne Diseases: Dengue fever, Malaria, Chikungunya
- Sexually Transmitted Diseases: Hepatitis B

Alerts:

- 31 December - Diarrhea outbreaks are occurring in multiple camps in the vicinity of Meulaboh in Aceh Province, Indonesia. The "majority" of the 11,000 people in seven camps in the area are affected.  
Food supplies are reported to be sufficient for the next week, fresh water and medical supplies are in short supply.

# India

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- Slightly larger than one-third the size of the US
- The Himalayas in the north with several peaks exceeding 25,000 feet
- Desert region in the northwest, essentially void of water
- Upland plain (Deccan Plateau) in the south 1500 miles long by 140 to 200 miles wide
- Climate:
  - Varies from tropical monsoon in the south to temperate in the north

# India

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India is HIGH RISK for these infectious diseases

- ❑ Foodborne And Waterborne Diseases: Diarrhea - bacterial, Hepatitis A, Hepatitis E, Typhoid / paratyphoid fever
- ❑ Vector-borne Diseases: Dengue fever, Malaria, Japanese encephalitis
- ❑ Animal-contact Diseases: Rabies

# Sri Lanka

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- Approximately the size of West Virginia
- The Northern one-half and portions of the southern coastal region consist of a gently rolling plain
- The south-central area is mountainous with elevations between 3,000 and 8,200 feet
- Climate
  - Tropical
  - Average temperature is usually between 75-88 degrees
  - Humidity is typically 70 percent or greater
  - Annual rainfall
    - 100-200 inches in the southwestern plain and uplands
    - 50-75 inches in the southeastern plains

# Sri Lanka

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Sri Lanka is HIGH RISK for these infectious diseases

- ❑ Foodborne And Waterborne Diseases: Diarrhea - bacterial, Hepatitis A, Typhoid / paratyphoid fever
- ❑ Vector-borne Diseases: Dengue fever, Malaria

Alert:

- ❑ 21 December – In Sabaragamuwa, Southern, Western Provinces, at least 50 people have been hospitalized (8 deaths) with influenza-like symptoms and respiratory distress. Officials state the outbreak is not due to avian influenza or severe acute respiratory syndrome (SARS), although no details were given about whether patients had been tested for these agents. No cases of H5N1 avian influenza have been reported in Sri Lanka in either birds or humans.



# Thailand

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- Slightly larger than California
  - Southeast coast consists of a low fertile plain
  - Northeast consists of the Korat Plateau occupying one-third of the nation
  - The Central Basin encompassing 25% of the land area
  - Northern and western mountains with peak elevations of 8,500 feet
- Climate
  - Tropical monsoonal climate
  - Temperatures range from 55 to 95 degrees
  - Rainfall varies from 40 inches in the Korat Plateau to 120 inches in the western mountains and southern peninsula



# Thailand

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Thailand is HIGH RISK for these infectious diseases:

- ❑ Foodborne And Waterborne Diseases: Diarrhea - bacterial, Hepatitis A
- ❑ Vector-borne Diseases: Dengue fever, Malaria, Japanese encephalitis
- ❑ Sexually Transmitted Diseases: Hepatitis B
- ❑ Animal-contact Diseases: Rabies
- ❑ Water-contact Diseases: Leptospirosis

# Thailand (continued)

## Alerts: 3 January - Sattahip Port and U Taphao

<u>Disease</u>	<u>Potential rates per month in US</u>
<u>personnel</u>	
□ Food- and waterborne diseases	
Bacterial diarrhea	Potentially over 50%
Hepatitis A	1 to 10% in unvaccinated personnel
Protozoal diarrhea	Up to 1%
Typhoid fever	Rare cases in unvaccinated personnel
Brucellosis	Rare cases
□ Vector-borne Diseases	
Chikungunya	Unknown
Rickettsioses, tickborne (spotted fever group)	A small number (less than 1%)
Typhus - miteborne (scrub typhus)	A small number (less than 1%)
Typhus - murine (fleaborne)	Rare cases

# Thailand (continued)

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## Alerts: 3 January - Sattahip Port and U Taphao

<u>Disease</u>	<u>Potential rates per month in US personnel</u>
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□ Other diseases in the region

Leptospirosis	1 to 10 percent
Schistosomiasis	Unknown (unlikely to exceed 1-10 percent)
Gonorrhea and chlamydia	Up to 50% among those having sexual contact with the local population
HIV/AIDS	Rare cases could occur
Hepatitis B	A small number (less than 1%)
Rabies (risk is among the highest in the world)	Rare cases
Q fever	Rare cases
Tuberculosis	PPD conversion rates may be elevated above baseline